AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A method of encoding binary data for transmission over an image data channel, comprising:

defining encoding parameters adapted for encoding the binary data in such a manner that a transformed linear matrix image produced by transmitting an encoded linear matrix image over the image data channel is reconstructable into the encoded linear matrix image; and

encoding the binary data into the encoded linear matrix image according to the encoding parameters, the encoded linear matrix image including at least one of the encoding parameters.

2. (Original) The method of claim 1, further comprising:

electronically storing the encoded linear matrix image as an image file.

3. (Original) The method of claim 2, further comprising:

associating the image file with a web page.

4. (Original) The method of claim 1, further comprising:

encrypting the binary data prior to the encoding.

5. (Original) The method of claim 1, further comprising:

identifying image-distortion characteristics of the image data channel; and wherein the defining includes analyzing the image-distortion characteristics so as to determine the encoding parameters.

6. (Original) The method of claim 1, wherein the binary data represents a firmware upgrade for a printing apparatus.

7. (Currently amended) ~~The method of claim 1,~~ A method of encoding binary data for transmission over an image data channel, comprising:

defining encoding parameters adapted for encoding the binary data in such a manner that a transformed linear matrix image produced by transmitting an encoded linear matrix image over the image data channel is reconstructable into the encoded linear matrix image; and

encoding the binary data into the encoded linear matrix image according to the encoding parameters, the encoded linear matrix image including at least one of the encoding parameters, wherein the encoding further includes encoding a data section of the encoded linear matrix image, the data section having a plurality of regions of colored data markings, each of the data marking regions representative of a predetermined quantity of the binary data.

8. (Original) The method of claim 7, wherein each individual one of the plurality of data marking regions has a predetermined size and one of a set of predetermined colors.

9. (Original) The method of claim 8, further comprising:

identifying image-distortion characteristics of the image data channel; and

determining the predetermined size and the set of predetermined colors from the image-distortion characteristics.

10. (Original) The method of claim 9, wherein the predetermined amount of the binary data encoded in each color marking region corresponds to the number of different predetermined colors in the set.

11. (Original) The method of claim 8, wherein the numeric value of the predetermined

quantity of the binary data represented by a selected individual one of the plurality of data marking regions corresponds to the particular one of the predetermined colors used for the selected data marking region.

12. (Original) The method of claim 9, wherein the image-distortion characteristics are obtained from a particular image data channel with which the encoded linear matrix image is associated.

13. (Original) The method of claim 9, wherein the image-distortion characteristics include one or more characteristics selected from the group consisting of dimensional scaling, color mapping, downsampling, clipping, pagination, margination, smoothing, compression, and printer control language encapsulation.

14. (Original) The method of claim 7, wherein the encoding further includes encoding a header section of the encoded linear matrix image, the header section having a plurality of regions of colored header markings, a subset of the header marking regions indicative of at least one encoding parameter used for encoding the data section.

15. (Original) The method of claim 14, wherein the header section further includes another subset of the header marking regions indicative of a detection key for recognizing the transformed linear matrix image.

16. (Original) The method of claim 14, wherein the header section further includes another subset of the header marking regions indicative of a tuning pattern usable for defining image-distortion characteristics.

17. (Currently amended) A method of encoding binary data for transmission over an

image data channel, comprising:

encoding the binary data into a linear matrix image having image attributes which ensure that a transformed linear matrix image produced after the transmission over the image data channel is decodable using at least one encoding parameter included in the linear matrix image so as to reconstruct the binary data from the transformed linear matrix image; and

electronically storing the linear matrix image as an image file.

18. (Original) A method of encoding binary data for transmission over an image data channel, comprising:

identifying image-distortion characteristics of the image data channel;

analyzing the image-distortion characteristics so as to define attributes of an encoded linear matrix image, the attributes defined such that a transformed linear matrix image formed by distorting the encoded linear matrix image according to the image-distortion characteristics is reconstructable into the linear matrix image; and

encoding the binary data into the encoded linear matrix image having the attributes.

19. (Original) A method of recovering binary data encoded in an encoded linear matrix image from a received linear matrix image received over an image data channel, comprising:

analyzing a header section of the received linear matrix image to determine image-distortion characteristics of the image data channel;

decoding the header section according to the image-distortion characteristics so as to recover at least one encoding parameter, the at least one encoding parameter previously used to encode the binary data; and

decoding a data section of the received linear matrix image according to the at least one encoding parameter so as to form recovered binary data.

20. (Original) The method of claim 19, further comprising:

recognizing a detection key in the header section.

21. (Original) The method of claim 19, wherein the analyzing further comprises:

comparing a tuning pattern portion of the header section to a predetermined tuning pattern to determine the image-distortion characteristics.

22. (Original) The method of claim 19, further comprising:

utilizing the recovered binary data.

23. (Original) The method of claim 22, wherein the binary data includes a firmware upgrade for a printing apparatus, and wherein the utilizing further comprises installing the firmware upgrade in the printing apparatus.

24. (Original) The method of claim 19, further comprising:

segregating the received linear matrix image from other channel data received from the image data channel.

25. (Original) The method of claim 19, wherein the at least one encoding parameter is selected from the group consisting of a number of color channels, a safe image width, a safe image height, a minimum X block size, a minimum Y block size, a minimum color offset, a minimum color value, and a maximum color value.

26. (Original) The method of claim 19, wherein the binary data encoded in the encoded linear matrix image is encrypted and wherein the at least one encoding parameter includes an encryption key, further comprising:

decrypting the recovered binary data using the encryption key.

27. (Canceled)

28. (Canceled)

29. (Currently amended) ~~The method of claim 28,~~ A method of sending binary data over an image data channel, comprising:

encoding the binary data into an encoded linear matrix image;

transmitting the encoded linear matrix image over the image data channel including distorting the encoded linear matrix image to form a transformed linear matrix image, wherein the distorting includes rendering the encoded linear matrix image with a web browser to form a partially-transformed linear matrix image; and

decoding the received linear matrix image to recover the binary data including decoding the transformed linear matrix image.

30. (Original) The method of claim 29, wherein the rendering forms a partially-transformed linear matrix image, the distorting further including:

sending the partially-transformed linear matrix image through a print channel to form the transformed linear matrix image.

31. (Original) An encoded linear matrix image representative of binary data, comprising:

a predetermined detection key recognizable in a transformed detection key portion of a transformed linear matrix image produced by transmitting the encoded linear matrix image over an image data channel, the encoded detection key adapted to delineate the transformed linear matrix image from other channel data;

a predetermined tuning pattern proximate the detection key, the predetermined tuning pattern comparable to a transformed tuning pattern portion of the transformed linear matrix image so as to define image-distortion characteristics of the channel;

at least one encoding parameter proximate the predetermined tuning pattern, a transformed encoding parameter image portion of the transformed linear matrix image processable according to the image-distortion characteristics so as to recover at least one corresponding encoding parameter; and

a data section representative of the binary data proximate the at least one encoding parameter, a transformed data section of the transformed linear matrix image processable according to the at least one encoding parameter and the image-distortion characteristics so as to recover the binary data.

32. (Original) The method of claim 31, wherein each of the predetermined detection key, the predetermined tuning pattern, the at least one encoding parameter image, and the data section includes a plurality of regions of color markings, each individual one of the plurality of regions having a predetermined size and one of a set of predetermined colors.

33. (Original) The method of claim 32, wherein each individual one of the plurality of regions in the data section has a color representative of a predetermined quantity of the binary data.

34. (Original) The method of claim 32, wherein the predetermined detection key, the predetermined tuning pattern, and the at least one encoding parameter image are separated from each other in the encoded linear image by white space.

35. (Original) The method of claim 32, wherein the predetermined size varies among individual ones of the plurality of regions in the predetermined tuning pattern.

36. (Currently amended) A ~~processor~~computer-readable medium having processor-executable instructions therein which, when executed by a processor, cause the processor to:

define encoding parameters adapted for encoding the binary data in such a manner that a transformed linear matrix image produced by transmitting an encoded linear matrix image over an image data channel is reconstructable into the encoded linear matrix image; and

encode the binary data into the encoded linear matrix image according to the encoding parameters, the encoded linear matrix image including at least one of the encoding parameters.

37. (Currently amended) A ~~processor~~computer-readable medium having processor-executable instructions therein which, when executed by a processor, cause the processor to:

analyze a header section of ~~the~~ a received linear matrix image to determine image-distortion characteristics of an image data channel;

decode the header section according to the image-distortion characteristics so as to recover at least one encoding parameter, the at least one encoding parameter previously used to encode the binary data; and

decode a data section of the received linear matrix image according to the at least one encoding parameter so as to form recovered binary data.

38. (Currently amended) A method for encoding binary data for transmission over an image data channel, comprising:

a step for defining encoding parameters adapted for encoding the binary data in such a manner that a transformed linear matrix image produced by transmitting an encoded linear matrix image over the image data channel is reconstructable into the encoded linear matrix image; and

a step for encoding the binary data into the encoded linear matrix image according to the encoding parameters, the encoded linear matrix image including at least one of the encoding parameters.

39. (Original) A method for recovering binary data encoded in an encoded matrix image from a received matrix image received over an image data channel, comprising:

a step for analyzing a header section of the received matrix image to determine image-distortion characteristics of the image data channel;

a step for decoding the header section according to the image-distortion characteristics so as to recover at least one encoding parameter, the at least one encoding parameter previously used to encode the binary data; and

a step for decoding a data section of the received matrix image according to the at least one encoding parameter so as to form recovered binary data.

40. (Currently amended) An apparatus for encoding binary data for transmission over an image data channel, comprising:

defining means for defining encoding parameters adapted for encoding the binary data in such a manner that a transformed matrix image produced by transmitting an encoded linear matrix image is reconstructable into the encoded linear matrix image; and

encoding means for encoding the binary data into the encoded linear matrix image according to the encoding parameters, the encoded linear matrix image including at least one of the encoding parameters.

41. (Original) An apparatus for recovering binary data encoded in an encoded matrix image from a received matrix image received over an image data channel, comprising:

decoder tuning means for analyzing a header section of the received matrix image to determine image-distortion characteristics of the image data channel;

encoding parameter reconstructing means for decoding the header section according to the image-distortion characteristics so as to recover at least one encoding parameter, the at least one encoding parameter previously used to encode the binary data; and

data-decoding means for decoding a data section of the received matrix image according to the at least one encoding parameter so as to form recovered binary data.

42. (Currently amended) An apparatus for encoding binary data for transmission over an image data channel, comprising:

a[[n]] distortion compensator which defines encoding parameters adapted for encoding the binary data in such a manner that a transformed matrix image produced by transmitting an encoded linear matrix image is reconstructable into the encoded linear matrix image; and

a linear matrix encoder communicatively coupled to the distortion compensator ~~attribute definer~~ which encodes the binary data into the encoded linear matrix image according to the encoding parameters, the encoded linear matrix image including the encoding parameters.

43. (Original) An apparatus for recovering binary data encoded in an encoded matrix image from a received matrix image received over an image data channel, comprising:

a decode tuner communicatively coupled to the image data channel which analyzes a header section of the received matrix image to determine image-distortion characteristics of the image data channel;

an encoding parameter reconstructor communicatively coupled to the decoder tuner which decodes a header section according to the image-distortion characteristics so as to recover at least one encoding parameter, the at least one encoding parameter previously used to encode the binary data; and

a data decoder communicatively coupled to the encoding parameter reconstructor which decodes a data section of the received matrix image according to the at least one encoding parameter so as to form recovered binary data.

44. (New) The method of claim 1, wherein the encoded linear matrix image includes all of the encoding parameters.